



***FOREST MANAGEMENT
IN
URBANIZING WATERSHEDS***

NC FORESTRY ASSOCIATION

- **Founded 1911**
- **Private, non-profit association representing forest product companies, wood suppliers, forest managers, landowners and others.**
- **Legislative and regulatory affairs; education; and communications**



HISTORY

- **Forest products was one of NC's first industries**
- **The “tar” in Tarheels refers to pine tar – one of our first exports**
- **NC was the birthplace of forestry in the United States**



FORESTS IN NORTH CAROLINA

- Over 17 million acres of forest – 58% of the state
- 89% is privately owned – the majority by non-industrial private landowners (700,000)
- Government owns only about 11%

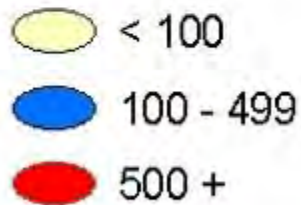
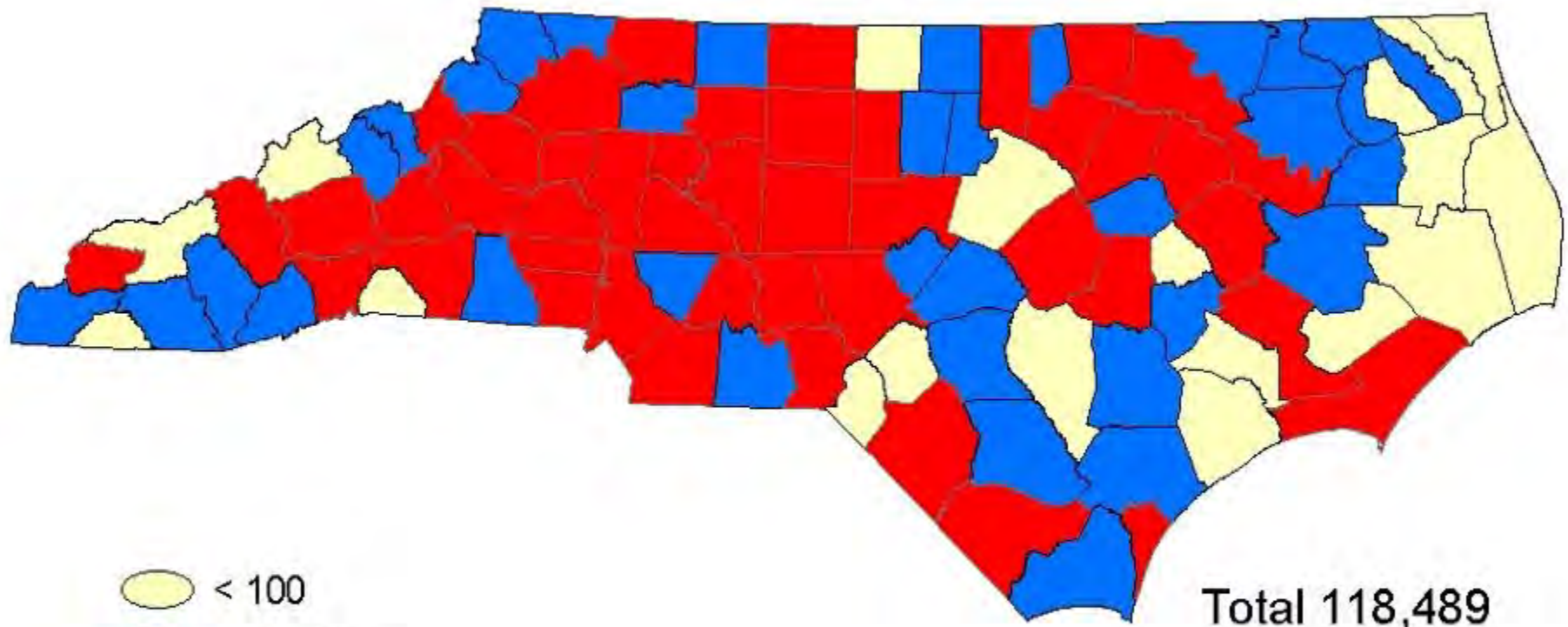


THE FOREST PRODUCTS INDUSTRY

- **Second largest manufacturing industry in NC**
- **118,000 direct jobs with an annual payroll of \$3.8 billion**
- **Total annual economic impact of 300,000+ jobs and \$29+ billion**



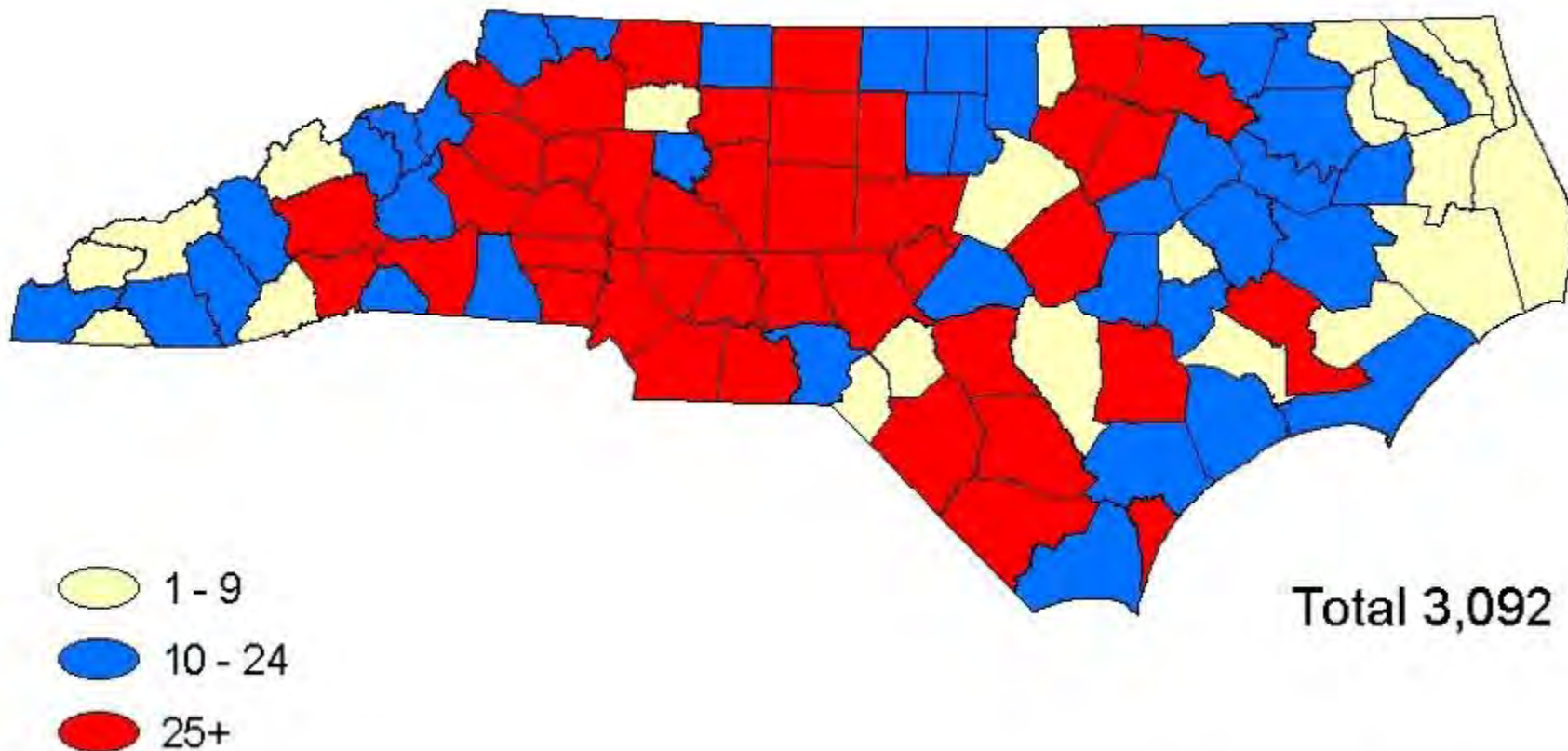
Forest Products Employees



Source: NC Employment Security Commission 2002

Created by: Center for Earth Observation
College of Natural Resources
North Carolina State University
September, 2003

Forest Products Manufacturing Facilities



Source: NC Employment Security Commission 2002

Created by: Center for Earth Observation
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ENVIRONMENTAL BENEFITS

**Clean air...for every 1
lb. of wood produced,
a tree takes in 1.4 lbs
of CO₂ and gives off 1
lb of oxygen**

**Younger forests are
more efficient than
older ones**



ENVIRONMENTAL BENEFITS

**Our cleanest water
comes from forests**



ENVIRONMENTAL BENEFITS

Wildlife habitat

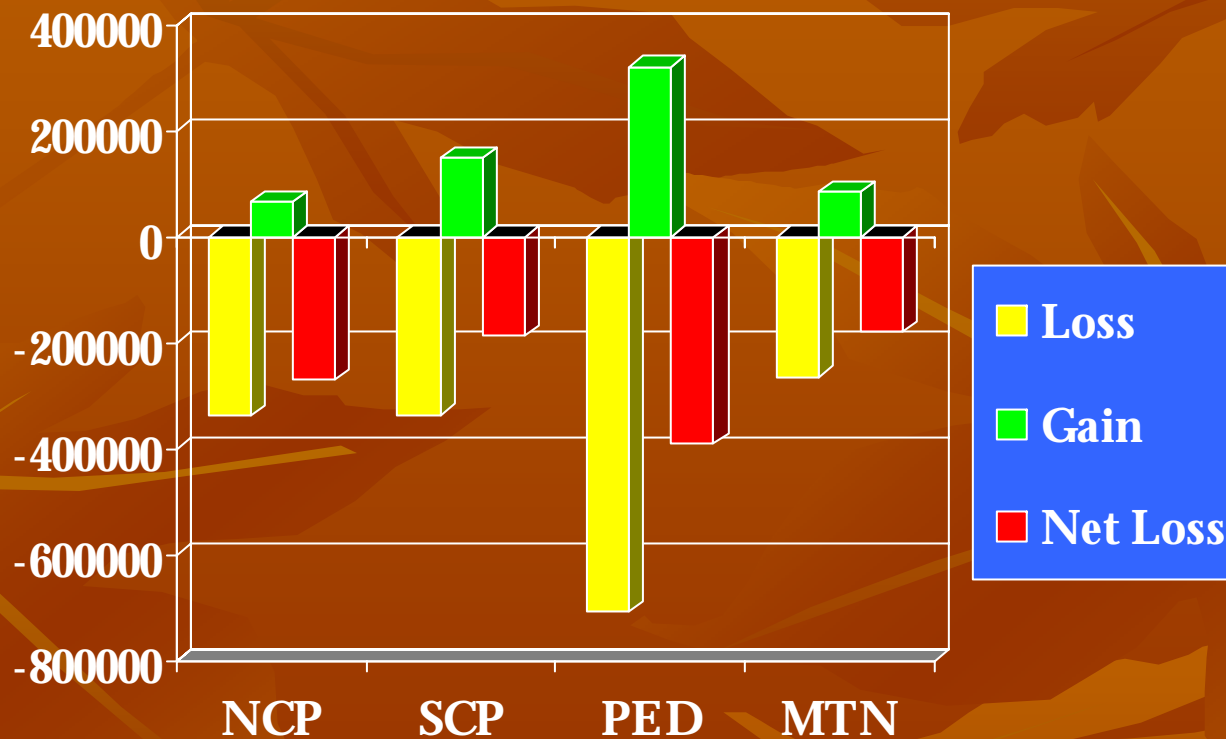


Recreation



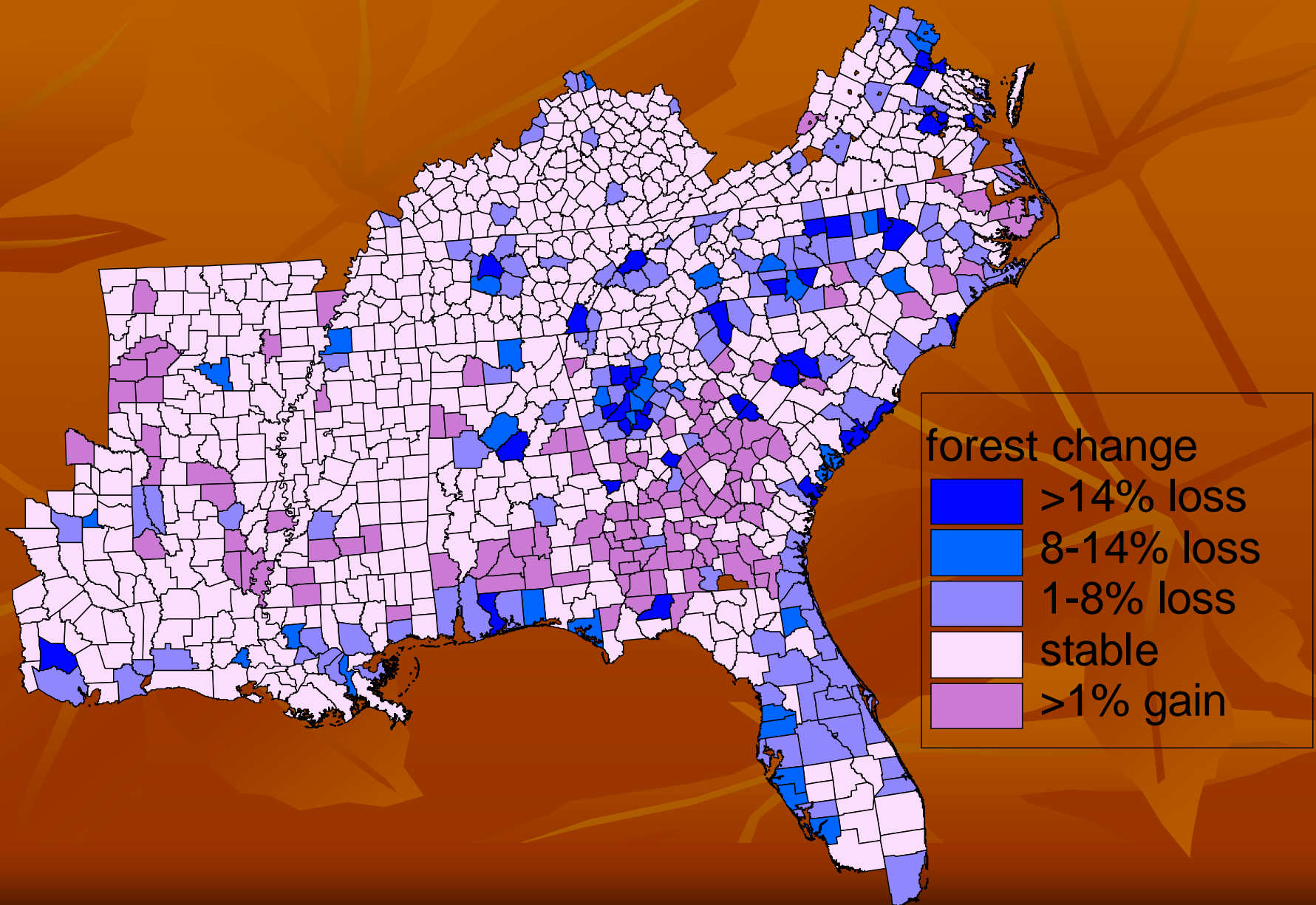
A CHANGING LAND BASE

Timberland Acreage 1990 - 2000



Net Loss of 1,024,000 acres – $\frac{3}{4}$ of this to urban development

Forecast change in forestland 1992 - 2010



A CHANGING LAND BASE

**Wildland-Urban
Interface: Where
forestland and
development meet**

**NC has over 12 million
acres impacted by
development – the
most in the US**



A CHANGING POPULATION

**Rural to Urban
population**

**Differing values and less
understanding of
forestry**

**51% of registered voters
in NC live in just 14
counties!**



THE CHALLENGE

How do we protect the important economic and environmental benefits provided by our forests, respect the rights of landowners and provide for economic development?

FACT: No alternative land use can economically compete with development!

THE ANSWER(S)?

There is no silver bullet answer!

A combination of reasonable regulations, incentives and public (and landowner) education is needed.

Remove obstacles and make forests/forestry a viable alternative.

BASIC ASSUMPTIONS

We want to maintain as much of our existing forestland base as possible;

Of all land uses, forests/forestry is the most benign;

Managed forests provide more benefits than unmanaged ones.



ISSUES/CONCERNS

**Aesthetics and Timber
Harvests;**

Water Quality/Quantity

**Distinguishing between
forestry and
development;**

Private Property Rights



REGULATIONS

Two types of regulations (both important to forestry):

Restrictive: may limit what can be done or specify how an activity must be done.

Permissive: permits, allows or limits restrictions on an activity.

REGULATIONS

Forestry activities are regulated by several federal laws including the Clean Water Act, the Endangered Species Act and the Coastal Zone Management Act.

At the State level, forestry is regulated under the Sedimentation Pollution Control Act and several river basin buffer rules.

REGULATIONS

- **Forest Practice Guidelines for Water Quality (15A NCAC 1I .0101 - .0209)**
 - Became mandatory for all forestry operations in 1990;
 - Establishes 9 performance standards to protect water quality;
 - Based on performance rather than prescription ..how you do it isn't as important as whether it works!
 - 4,000 inspections done annually by DFR with a 90+ compliance rate.

REGULATIONS

Permissive Regulations should be designed to protect/encourage forest management without jeopardizing environmental benefits or protections.

In NC, permissive regulations include:

Zoning limitations, public nuisance, landowner liability, and limits on local government regulations on forestry activities.

INCENTIVES

Federal and state incentive programs in place:

Federal tax provisions support reforestation;

Reduced taxation on timber income;

Some cost-share funding for forest mgt practices;

At the state level: cost-sharing for forest mgt. practices; reduced land taxes; conservation easements.

INCENTIVES

The most important incentive is strong markets for wood and wood products.

The economic value of wood provides a critical incentive for landowners to grow trees.



EDUCATION

NC has over 700,000 private landowners

--Trend is toward more landowners owning fewer acres;

Most know little about forestry or where to go for help;

Vast majority have economic goals for their land that must be met.

EDUCATION

Urbanizing public with little connection to the land;

Often miss the link between products and where they come from;

No understanding of the link between markets and forests;

The public often drives policy which then impacts landowners and forestry.

SUMMARY

Despite land losses, NC has a huge forest resource;

That resource is largely owned by private, nonindustrial landowners;

Maintaining and enhancing this resources and their benefits will take a mix of regulations, incentives and education.

BUT ULTIMATELY...

SUMMARY

If our forests lose their economic value to the people who own them, then we will have less forestland and less management.

Pioneer Forest LLC

Owned by the L-A-D Foundation

A for-profit business enterprise of about 160,000 acres.

A unique forest management philosophy in the world of today.

A high standard of environmental ethic based on sustainable forestry.

Natural area and habitat protection

Founded by Leo A. Drey in 1951

Donated to the L-A-D Foundation in 2004.





When it is done right...

Third harvest

15 trees removed.

No damage to residual stand.

3871 board feet per acre left

2166 board feet per acre harvested



General Marking Protocol

Cordwood

Living

Sound

Leave for future

Harvest now

Defective

Keep for wildlife

TSI

Snag for standing dead wood

Coarse Woody Debris

Dead

Down

Coarse Woody Debris

Salvage

Standing

Keep for wildlife

Salvage

Sawtimber

Living

Sound

Leave

Legacy

Future Harvest

Harvest now

Defective

Leave

Wildlife

Legacy

Den Tree

Harvest

Dead

Down

Coarse Woody Debris

Salvage

Standing

Wildlife

Coarse Woody Debris

Standing snag

Salvage

“My estimates of canopy turnover due to single-tree selection harvest is between 189 to 228 years. This calculated turnover time is longer than the 60 to 120 years for most clear-cut stands. The long amount of time required for Pioneer Forest to harvest all canopy trees allows for the existence of many microhabitats below the canopy over a long period of time. When only small portions of the forest canopy are opened at one time, the effects that a disturbance has on light penetration, changes in microclimate, and species replacement are limited.”

Elena M. LaVigne

Heterogeneity within and among selectively harvested forest stands in the Missouri Ozark mountains

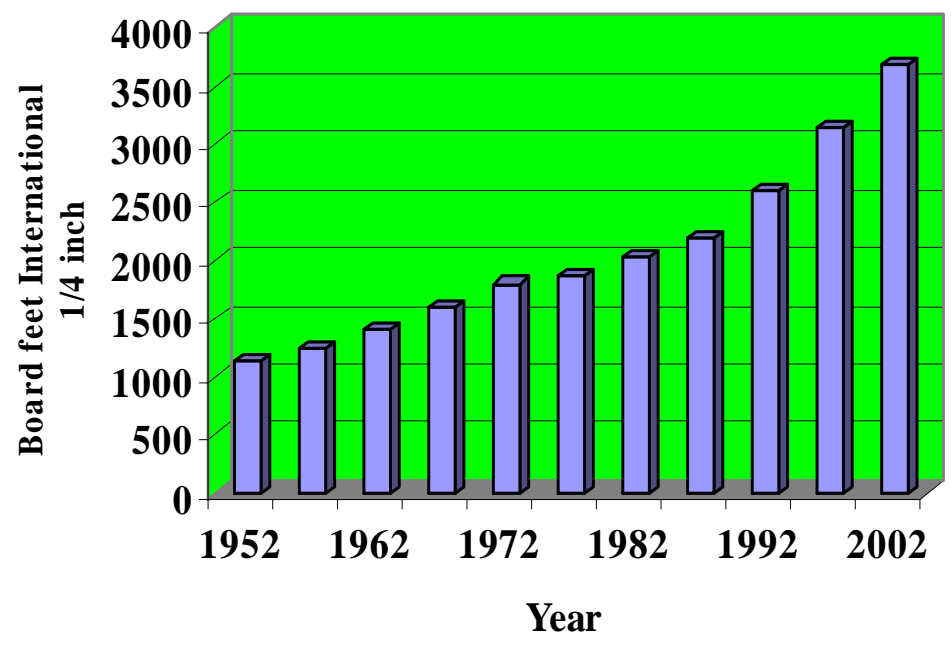
MS, 2002, Saint Louis University

Volume per acre

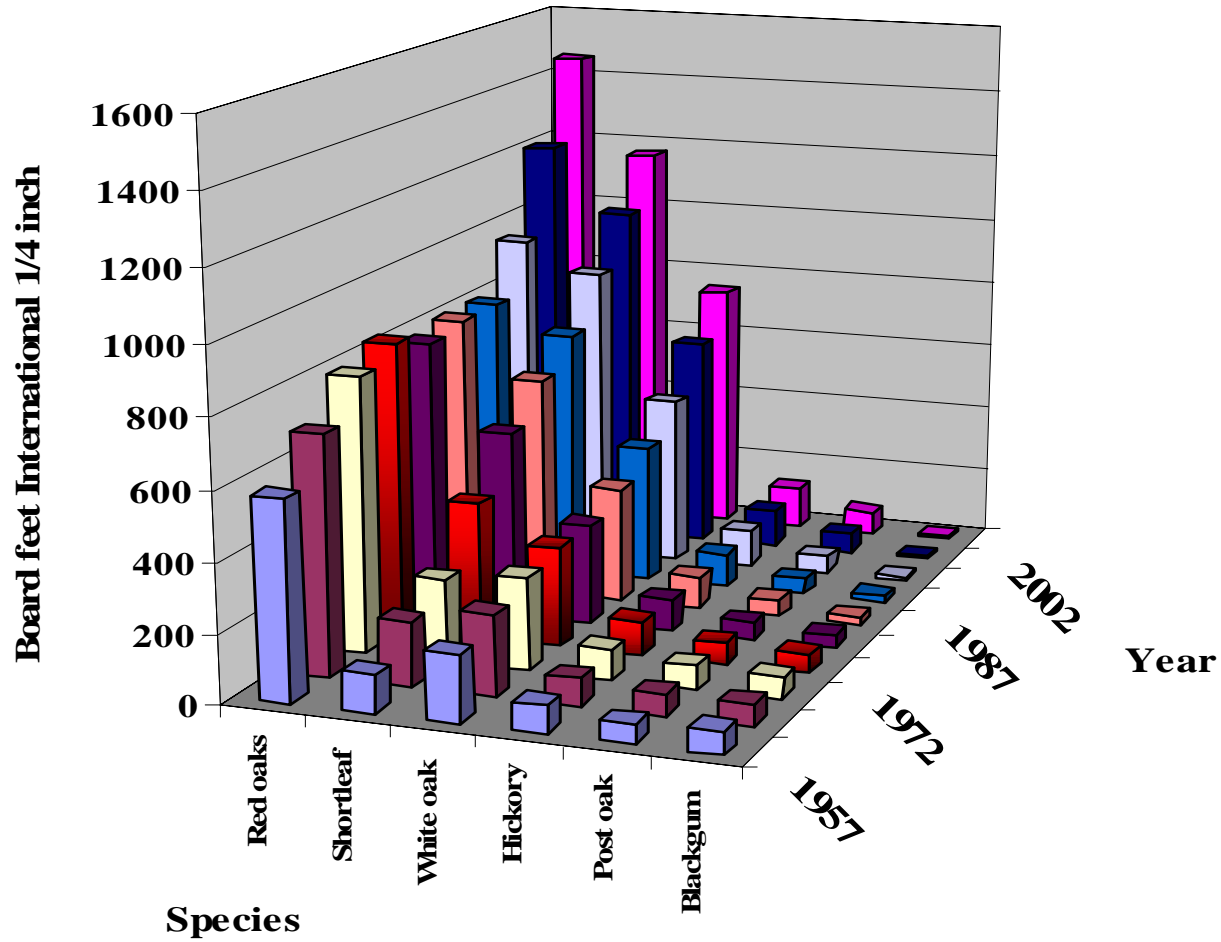
Board feet, International 1/4

Year	Volume (Board feet)
1952	1128
1957	1236
1962	1409
1967	1595
1972	1797
1977	1855
1982	2024
1987	2199
1992	2588
1997	3133
2002	3680

Pioneer Forest Board feet per acre 2002 CFI



**Pioneer Forest
2002
Sawlog volume per acre**

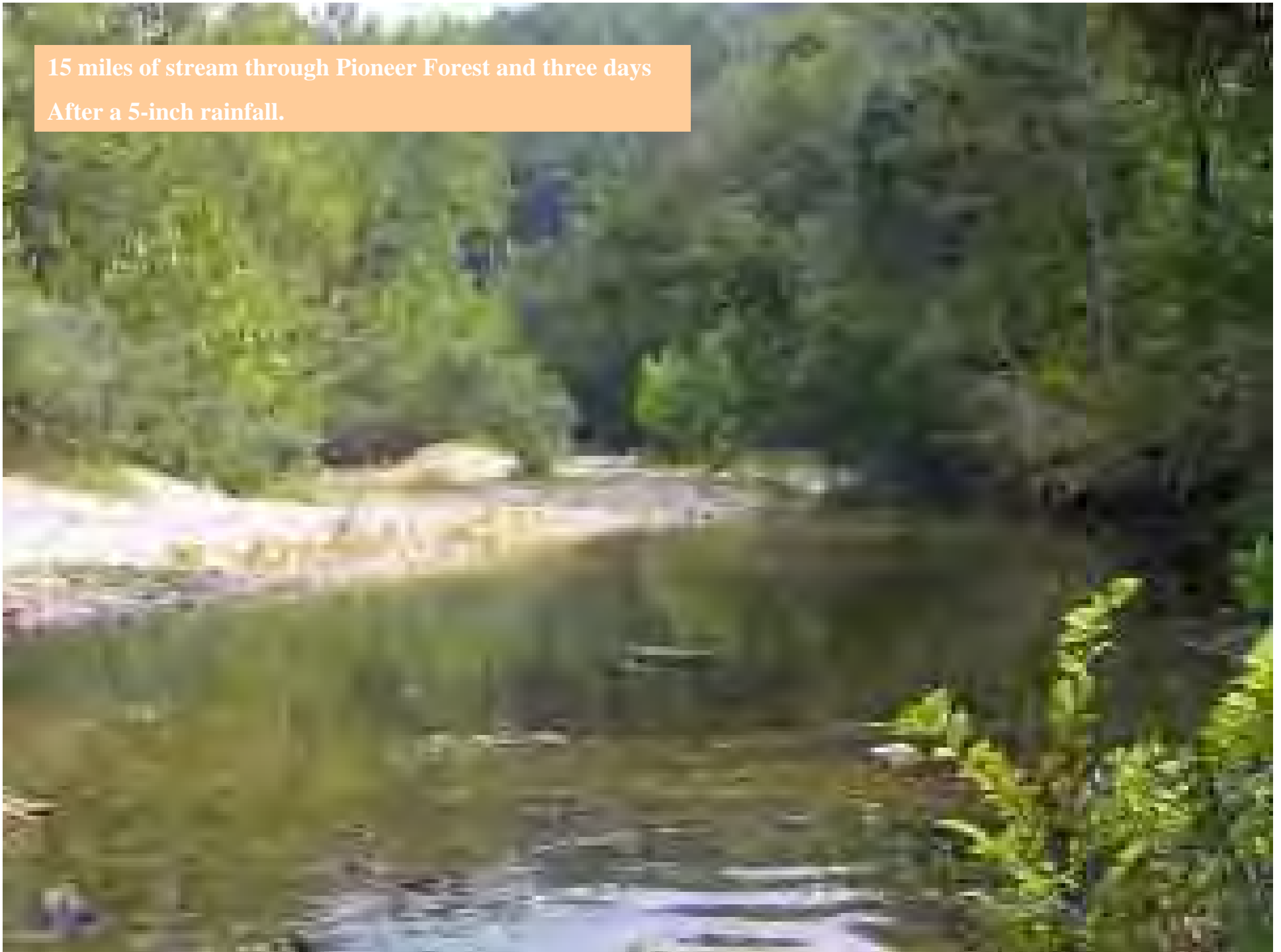


Hillside in background was logged 6 months ago.

Note retained cover and intact forest.



15 miles of stream through Pioneer Forest and three days
After a 5-inch rainfall.



Buffer zones along streams help reduce sedimentation in streams. Buffer width varies with topography with increasing width with increasing steepness.



Perpetual ground cover.

**Logging slash left in place
will serve to slow the speed
of runoff.**



Missouri has no mandatory BMPs and this is often the result



This is the same landing the following summer.





Even simple efforts are often enough to significantly reduce erosion, sedimentation in streams and slow runoff.

On this gentle slope a skidder was used to put in five water bars from the top of the ridge to the road below.





Or the structures can be more elaborate.

Mandatory BMPs on Pioneer Forest put in place on every timber sale. This landing repair took about 20 minutes of the loggers time. will recover naturally.





Rocky Hollow

Clifty Creek

Hickory Canyons

Dillard Mill State Park

Ball Mill Resurgence

Dripping Springs

The Narrows

Cave Spring

Horseshoe Bend

Current River Natural Area

Pioneer Natural Area

Virgin Pine

Scenic Easements

Grand Gulf State Park